

What is claimed is:

1. A friction stir welding method of joining an
abutment portion by moving a rotating probe relatively along
said abutment portion while pressing said probe against one
surface of said abutment portion at which an end of a first
cylindrical member and an end of a second cylindrical member
are butted together, said friction stir welding method
comprising the steps of:

externally fitting said first and second cylindrical
members on a backing jig so that another surface of said
abutment portion is in close contact with an outer
circumferential surface of said backing jig;

performing friction stir welding on said one surface of
said abutment portion while retaining said other surface of
said abutment portion with said backing jig; and

separating said backing jig from said other surface of
said abutment portion after said friction stir welding.

2. The friction stir welding method according to
claim 1, wherein said first and second cylindrical members
are externally fitted on said backing jig while said first
and second cylindrical members are relatively expanded as
compared with said backing jig.

3. The friction stir welding method according to
claim 1, wherein said first and second cylindrical members

are relatively expanded as compared with said backing jig to separate said backing jig from said first and second cylindrical members after said friction stir welding.

5 4. The friction stir welding method according to claim 1, wherein said first and second cylindrical members are welded by said friction stir welding along said abutment portion while a pressing force is applied in a direction substantially perpendicular to a direction of insertion of
10 said probe.

 5. The friction stir welding method according to claim 1, wherein said outer circumferential surface of said backing jig has a completely circular shape, and
15 circumferences of said ends of said first and second cylindrical members, which are in close contact with said outer circumferential surface, have an identical length.

20 6. A friction stir welding apparatus for joining an abutment portion by moving a rotating probe relatively along said abutment portion while pressing said probe against one surface of said abutment portion at which an end of a first cylindrical member and an end of a second cylindrical member are butted together, said friction stir welding apparatus
25 comprising:

 a pedestal member on which said first and second cylindrical members are fixed;

a backing jig on which said first and second cylindrical members are externally fitted so that another surface of said abutment portion has a predetermined circumferential length, said backing jig being separated from said abutment portion after friction stir welding; and
5 a pressing mechanism which applies a pressing force to said abutment portion.

7. The friction stir welding apparatus according to
10 claim 6, wherein said pressing mechanism applied said pressing force to said first and second cylindrical members in a direction substantially perpendicular to a direction of insertion of said probe.

8. The friction stir welding apparatus according to
15 claim 6, wherein an outer circumferential surface of said backing jig has a completely circular shape, and circumferences of said ends of said first and second cylindrical members, which are in close contact with said
20 outer circumferential surface, have an identical length.

9. The friction stir welding apparatus according to claim 6, further comprising a clamp jig which is arranged on said one surface of said abutment portion and which prevents
25 said abutment portion from deformation during said friction stir welding.